293 Two-year follow-up for lung function, muscle strength and functional capacity in cystic fibrosis

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The purpose of this study was to investigate the change in lung function, respiratory and peripheral muscle strength, and functional capacity during two-year follow-up period in patients with cystic fibrosis followed by home respiratory physiotherapy treatment.
Eight patients with cystic fibrosis (16.63±3.93 years, FEV1 = 63.38±19.75%) participated in this study. Pulmonary function tests were performed. Respiratory muscle strength (MIP and MEP) was measured using a mouth pressure device. Quadriceps femoris strength was measured using a hand-held dynamometer. Functional capacity was evaluated with 6-minute walk test (6MWT). Body mass index (BMI) was calculated. Patients were followed by an individually applied respiratory physiotherapy during the follow-up period. All measurements were repeated after the completion of the one and two-year follow-up period.
The repeated measures of follow up showed that there was no significant difference among inspiratory and expiratory muscle strength, quadriceps muscle force, and six-minute walk distance after two-year follow-up ($p > 0.05$). There was significant difference among FVC, FEV1, and BMI ($p < 0.05$). In conclusion, respiratory muscle strength, peripheral muscle strength, and functional capacity were preserved by regular respiratory physiotherapy after two-year while airway obstruction increased in patients with cystic fibrosis. Body composition also worsened.

294 Chronotropic response to exercise in cystic fibrosis

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Purpose: Cystic fibrosis patients have reduced exercise tolerance. The purpose of this study was to investigate chronotropic heart rate response (heart rate reserve used at peak exercise) to peak bicycle exercise in patients with cystic fibrosis.
Material and Methods: Sixteen patients with cystic fibrosis (age: 13±4 years, 10 M, 6 F, FEV_1: 80±27%) participated in the study. Pulmonary function test was performed. Respiratory muscle strength, quadriceps force, and percent body fat were measured. A graded bicycle ergometer exercise test and a six minute walk test were performed. Heart rate, blood pressure, oxygen saturation, dyspnea and fatigue perception were measured before and after the test.
Results: Nine patients (56%) had lower chronotropic index. Patients with a lower chronotropic index were significantly younger, and reached significantly lower percentage of maximal heart rate during peak bicycle exercise ($p < 0.05$). There was no significant difference in pulmonary function test values, respiratory and quadriceps muscle strength, percent body fat and six minute walk distance ($p > 0.05$) between patients with low and normal chronotropic index. Chronotropic response was significantly related with Crispin Norman score ($p < 0.05$).
Conclusion: Chronotropic response to peak exercise is decreased in cystic fibrosis. It is related to radiological findings from the view point of Crispin Norman score.

295* High frequency chest wall oscillation in cystic fibrosis

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High frequency chest wall oscillation (HFCWO) is widely used in the United States and has recently been approved for use in Europe.
Aim: To compare the short-term effects of HFCWO with patients' usual airway clearance techniques (ACT) in people with cystic fibrosis admitted to hospital with an acute infective pulmonary exacerbation.
Methods: A randomised cross-over design, powered to detect a 4-gram difference in expectorated sputum. Over four days patients received either HFCWO on Days 1 & 3 and their usual ACT on Days 2 & 4 or vice versa. Airway clearance sessions were 30 minutes twice a day. Expectorated wet weight of sputum, lung function, perceived efficacy (using a visual analogue scale) and preference were measured. The difference between usual ACT and HFCWO was estimated using a mixed linear regression model.
Results: Thirty patients (22 male) were recruited, mean age 29.7 (8.4) years and mean percent predicted FEV_1 37.7(16.5)%. Twenty-nine patients completed the study. The majority (83%) used the active cycle of breathing techniques or autogenic drainage as their usual ACT. Significantly more sputum was expectorated during a single treatment session with usual ACT than with HFCWO ($p < 0.001$). No significant change in FEV_1 was observed within or between either regimen. Patients' usual ACTs scored significantly higher for efficacy than HFCWO (mean difference = 14 mm; $p = 0.002$) and seventeen (55%) patients expressed a preference for usual ACT over HFCWO.
Conclusion: During a finite treatment period more sputum was cleared using patients' usual ACT than HFCWO. HFCWO does not appear to cause any adverse physiological effects and may influence adherence.
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296 Adaptation of intrapulmonary percussive ventilation for children with cystic fibrosis

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Aim: The efficiency evaluated of intrapulmonary percussive ventilation (IPV) for children with cystic fibrosis (CF) for endobronchial secretions drainage.
Materials and Methods: IPV was performed on "IMP2" of "Breas Medical" (Sweden). Each patient received 20 ml of normal saline via the nebulizer component of the IPV. They also used autogenic drainage (AD) and relaxation. The IPV courses were over 2–7 days, usually at a frequency of 4 times per day. Lung function was estimated on the "Jaeger Flow Screen Pro". All patients were on standard cystic fibrosis treatment.
Results: IPV received 9 patients with CF, 4–16 years of age, 5 m., 4 f. The operating pressure was in the range from 1.2 to 2.2 bar, patient pressure to the inhalation was 15±7.2 mbar or exhalation: 21±6 mbar., attitude percussion to the inhalation (max): exhalation (min) accordingly 1:2±0.31, frequency percussion from 128 to 400 c/m, in average 160:261 c/m depending on age. SaO_2 increased significantly from 92±3.8% to 96±2.9% ($p = 0.03$). The quality of sputum increased dramatically. But there were no significant difference in spirometry indexes on IPV treatment [before: FVC = 81±15.4; FEV_1 = 67±11.2; FEV_{25-75} = 43±9% and after IPV: FVC = 83±16.9; FEV_1 = 66±12.3; FEV_{25-75} = 48±13.8% ($p > 0.05$)].
Conclusion: IPV is safe and effective type of physiotherapy for children with cystic fibrosis. IPV requires further clinical evaluation on a larger number of patients.